

BOOK REVIEW

CAROL M. LALLI AND RONALD W. GILMER. 1989. *Pelagic Snails. The Biology of Holoplanktonic Gastropod Mollusks*. Stanford University Press, Stanford, California, pp. i-xiv, 1-259, 25 tables, 76 text-figures, 16 color figures. ISBN 0-8047-1490-8. \$45.00.

The study of pelagic animals, organisms living in the oceanic water column, has been revolutionized by their examination and collection *in situ*. Initially, this was largely accomplished by open ocean SCUBA diving in surface waters, but more recently it has been extended to include depths accessible only to deep-sea submersibles equipped with special collecting apparatus.

Pelagic snails, of which there are about 140 species, comprise one of the more important moieties of the oceanic fauna and except to a few knowledgeable marine scientists, these wonderful creatures are virtually unknown. One can imagine the excitement experienced by the early naturalists who first observed and described these animals. As early as 1705, Breyn figured the violet-snail, *Janthina*, and its bubble-filled float in the *Philosophical Transactions of the Royal Society*, and in his posthumous 1775 work, Forskål, who travelled on the ill-fated Danish expedition to "Arabia Felix", illustrated several oceanic forms including the pseudothecosomatous pteropod *Gleba*. The glassy nautilus, *Carinaria cristata*, a representative of these oceanic animals, was once considered so rare and unusual by eighteenth and nineteenth century collectors that it fetched at auction a price twice that of the famous *Conus gloriamaris*. This heteropod attains the largest size of all pelagic snails, reaching about a half meter in length.

Lalli and Gilmer have rendered an important service in providing a stimulating review of the biology of holoplanktonic gastropods. Simultaneously they have significantly contributed new and previously unrecorded observations on these relatively poorly known groups. Their approach has been to stress the living animal in its natural environment.

To live a life entirely in the open ocean without access to solid substrates has required the evolution of unique adaptations in form, color, and behavior. The authors discuss such modifications in regard to swimming, floating, and attaching to objects adrift in the water column. Transformations of the typical gastropod foot have led to unusual structures which may facilitate swimming or feeding.

Both prosobranch and opisthobranch lineages in the gastropods have given rise to pelagic snails, of which the authors consider five separate groups in as many individual chapters. Each of these is a unit unto itself with specific sections on such topics as external anatomy, adaptations for swimming or floating, methods of obtaining nutrition, reproduction and development, parasites, and evolution; a list of taxa recognized in each group is given as is a list of references.

After a short introduction, they first treat the unique neustonic janthinids, *Janthina* and *Recluzia*, which are ptenoglossate prosobranchs living suspended from the surface film of the ocean by a self-created bubble-filled raft. Voracious predators, these so-called violet sea-snails feed on the by-the-wind sailor *Velella velella* and the Portuguese man-of-war *Physalia physalis*. The second group to be considered consists of the prosobranch Heteropoda embracing three families of carnivores that utilize vision to capture their prey.

The shelled pteropods, an opisthobranch lineage, constitute the third group of some 50 species; one portion of these, the so-called more advanced pseudothecosomatous pteropods have a secondarily derived gelatinous pseudoconch or false shell. Only recently have some of the unique feeding adaptations of these animals been described: an enormous mucoid feeding web up to two meters in diameter is produced by the animal, which is about 60 mm wide; it entraps minute plankters and is pulled in to be digested.

The shell-less pteropods, or Gymnosomata with seven families and fewer than 50 species is the fourth group discussed. These opisthobranchs are all carnivores and show unique adaptations for the capture of prey, some having

developed prehensile appendages remarkably like the tentacles of cephalopods to grasp and hold their food.

Last to be discussed are the few but nevertheless fascinating nudibranchs which have assumed an almost entirely holoplanktonic existence. These include the dendronotaceans *Phylliroe* and *Cephalopyge*, small fish-like predators of cnidarians as well as *Glaucus*, *Glaucilla* and *Fiona* which also prey on pleustonic cnidarians such as *Velella*, *Porpita* and *Physalia* as well as floating stalked barnacles. The blind *Glaucus* with its beautifully oceanic blue camouflage can, as an additional defense mechanism, stuff its cerata with the stinging cells or nematocysts of the Portuguese man-of-war and become one of the very rare animals, a killer mollusk.

The work is strengthened by its excellent illustrations and color plates as well as by the glossary which defines the rather specialized vocabulary applied to the pelagic realm. Both systematic and subject indices are provided.

—K. J. Boss